

## Comminution and Classification

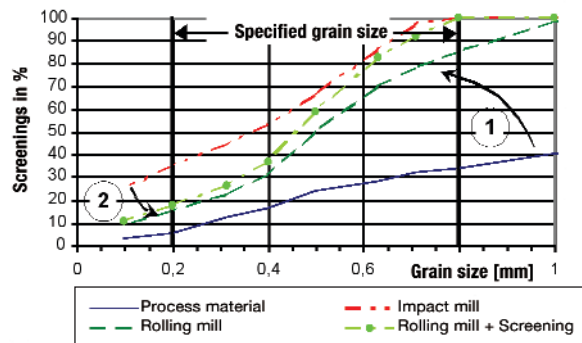
### Our service ...

Solid materials very seldom leave the basic production process at the desired grain size distribution. In many cases, comminution is required to obtain the specified grain size. Solid products frequently also contain misshapen fractions, such as dust or rough grains, that must be separated via classification using screening machines or flow classifiers. In dry processes, air-driven separators or pneumatic classifiers are used.

Common problems in comminution and/or classification processes are:

- caking;
- wear;
- fluctuating/inadequate product quality;
- lack of automation;
- high specific energy consumption;
- inadequate classification yield;
- outdated processes.

In many cases we have the appropriate solutions to these problems.

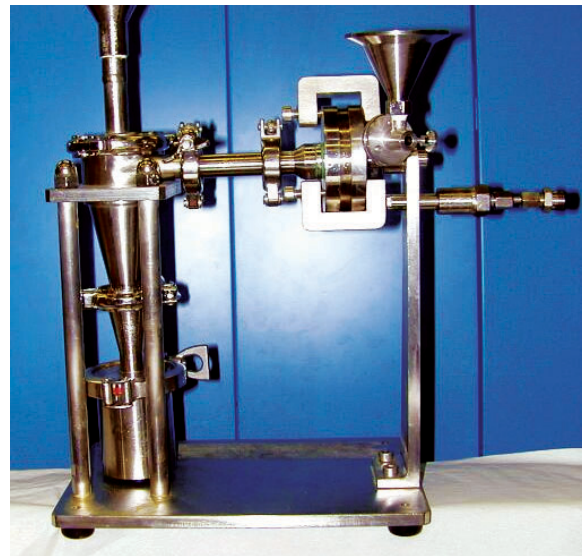


*Yield increase in the desired grain size range through use of a better suited mill and milling-classifying cycle*

Our large assortment of classifiers and equipment for dry and wet comminution on the pilot plant and commercial production scale ensures that we will select and design the optimal unit for your product. We can also produce sample quantities from one kilogram to several tons.

We perform the scale-up of the comminution and classifying equipment as required for production and can provide concepts for technical implementation. If you wish, we will support your project from the engineering phase through commissioning. In addition to determining operating and design data, we can also help you to optimize existing units.

During the development phase of a product, often only a few grams of product produced in a laboratory are available due to reasons of costs and capacity. It is typically expected that these small amounts be used in application tests at quality levels which can also be achieved on a pilot plant scale. Finding a recipe using only small amounts of product is a challenge, particularly where wet comminution is required. We can leverage our equipment and know-how to help you handle very small amounts of material. Formulation for wet milling is supported by methods from interfacial physics and colloid chemistry.



*Spiral jet mill (LSM50) for micronization of just a few grams of product at high yield*



## ... is your gain.

You benefit from:

- interdisciplinary cooperation for the development of comminution and classification processes;
- use of our large assortment of flexible equipment and units for process selection, design and optimization, and production of sample quantities;
- objective selection of the technology best suited to your product with consideration of prevailing operating conditions and costs;
- development and implementation of new processes and developments;
- comprehensive theoretical knowledge of comminution and classification technology;
- our knowledge of related markets;
- experienced personnel in labs and pilot plants;
- quick installation and commissioning of pilot plants by combining existing equipment from our machine and equipment fleet (supplemented with leased equipment, if necessary);
- experience in handling "difficult" products, e.g. color-intense products or harmful substances.

## Result of one process development:



Before: The product to be processed is a viscous, sticky paste.



After: The finished product, milled and dried in one process step, is a flowing powder.

## Equipment:

Laboratory-scale equipment:

- Dry comminution
  - Cutting granulator
  - Mechanical impact mill
  - Spiral jet mill
  - Fluidized bed opposed jet mill
  - Ball mill
- Wet comminution
  - Rotor-stator wet mill
  - Stirred media mills
- Screens and air classifiers
  - Analytical screening machines
  - Air jet screen
  - Zigzag classifier
  - Deflector wheel classifier

Pilot plant scale equipment:

- Dry comminution
  - Jaw crusher
  - Cutting granulators
  - Mechanical impact mills
  - Spiral jet mills
  - Fluidized bed opposed jet mill
  - Ball mills
- Wet comminution
  - Corundum disc mill
  - Rotor-stator wet mill
  - Stirred media mills
- Screens and flow classifiers
  - Vibrating Screens
  - Air jet screens
  - Deflector wheel classifier
  - Hydraulic (countercurrent) classifier

Particle characterization:

- Particle measuring technology (particle size, specific surfaces, porosity, etc.)
- Interfacial physics and colloid chemistry laboratories (zeta potential, viscosity, etc.)
- Bulk material properties (flowability, wear properties, caking properties, etc.)

## References

- Cellulose derivatives
- Auxiliaries for rubber
- Dyes and pigments
- Active substances

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